GATX Rail Europe

Operating Instructions

GATX Type

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LEADING RAILCAR SOLUTIONS

GATX Rail Germany GmbH
Valentinskamp 70
20355 Hamburg
Germany

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The technical information and notes contained in these operating instructions correspond to the current status of the tank wagon.

Date	Version	Remarks
2015-03-02	1.0	First edition
2015-03-25	2.0	Correction

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1 Introduction

1.1 Owner and ECM: GATX Rail Europe

GATX Rail Europe (GRE) was founded in 2006 and encompasses GATX Rail Austria, GATX Rail Germany, GATX Rail France and GATX Rail Poland. We are part of the American GATX Corporation, one of the world's largest owners of private freight cars, which was founded in 1898. Since this time, GRE's core business has been the leasing of tank wagons to industrial users, freight forwarders and railway undertakings.

GRE has a diversified and high-performance fleet of over 20,000 wagons, one of the largest fleets of privately owned wagons in Europe. This fleet is constantly modernised through new constructions and conversions. The wagons are tailored to the needs and requirements of shippers, meet the standardisation regulations and comply with national and international legislation.

Our long-term success is the result of the committed and efficient deployment of our employees and material. GRE employees offer a wealth of experience and extensive specialist knowledge of the private freight wagon business. At the same time, they are highly motivated and are thus a crucial factor of our success. GRE's organisational structure guarantees fast and short decision paths plus flexible solutions.

GRE is certified according to ISO 9001 and ECM.

The tank wagons meet all legal and standardisation requirements for transporting HAZMAT (hazardous materials) and running on all standard gauge European railway lines. The tank wagons are manufactured according to the most stringent standards of quality and safety.

1.2 About these operating instructions

These instructions are aimed at fillers and unloaders, and describe how to operate the tank wagons safely and efficiently. Adherence to all safety instructions and handling instructions is the prerequisite of safe and proper work.

The instructions are part of the scope of delivery. The trained personnel must have carefully read through and understood these instructions prior to the start of all work.

The occupational accident prevention regulations and general safety regulations applicable to the area in which the wagon is operated must also be adhered to.

1.3 Representation methods

These operating instructions contain different representation methods, the meaning of which is explained in the following.

1.3.1 Visualisation of safety information

Safety information is identified through a symbol and a signal word. A distinction is made between four levels of danger.

All safety information is structured according to the same four-stage pattern.

⚠DANGER

Source of the danger

Consequences of non-observance.

– Measures for averting the danger.

The signal word DANGER indicates safety information warning of hazards which, if not avoided, will result in death or serious injury.

⚠WARNING

Source of the danger

Consequences of non-observance.

– Measures for averting the danger.

The safety information WARNING designates a possibly hazardous situation.

If it is not avoided, fatal or severe injuries may result.

⚠CAUTION

Source of the danger

Consequences of non-observance.

– Measures for averting the danger.

The safety information CAUTION designates a possibly hazardous situation.

If it is not avoided, slight or minor injuries may result.

NOTICE

Source of the danger

Consequences of non-observance.

– Measures for averting the danger.

The safety information ATTENTION designates a possibly harmful situation.

If it is not avoided, material damage to the wagon, the product or the environment may occur.

1.3.2 Visualisation of separate information

In these operating instructions, separate information is identified with the following symbol.

Information

Application tips and supplementary information.

1.3.3 Visualisation of action instructions and lists

Action instructions require you to do something.

"**Prerequisites**" list conditions that have to be met before you start an action.

Action instructions in which the sequence has to be observed are numbered:

1. Action 1
2. Action 2
3. Action 3

Action instructions with an arbitrary sequence are identified with dashed list items:

– Action
– Action
– Action

Lists are identified with bullet points:

• Part 1
• Part 2

1.4 Definitions

1.4.1 Abbreviations

GCU

The General Contract of Use for Freight Cars (GCU) is a multilateral railway law contract and regulates the use of freight cars on the member railway network. It came into force on July 1st 2006 as the successor of the RIV.

ECM

Entity in Charge of Maintenance as per the current EU directive.

EN standards

The European standards (EN) are technical regulations ratified by the EU.

RID

The "Regulations concerning the International railway transportation of Dangerous Goods" regulate the transportation of HAZMAT (hazardous materials) by rail.

The current version of the RID is available at: www.otif.org.

TSI-WAG

The Technical Specifications for Interoperability (TSI) are technical specifications with legislative character defined by the European Commission for interoperable rail traffic throughout Europe.

UN number

The UN number is a ID number defined as per RID to clearly identify HAZMAT (hazardous materials).

2 Safety

2.1 Proper use

GATX pressure gas wagons comply with the stipulations of the TSI-WAG, valid UIC leaflets, the stipulations General Contract of Use for Wagons GCU plus the applicable EN standards.

The pressure gas wagon is unreservedly intended for operation on all standard gauge European railway lines.

The pressure gas wagon is approved in accordance with its RID tank code.

At most, the pressure gas wagon may be filled with the maximum permissible weights specified in the load table. They take into account all parameters such as filling degree according to RID, tank capacity and tare weight.

Refer to the separately provided documents for the technical data and specific equipment of the pressure gas wagons.

Proper use includes the observance of these and all other operating instructions provided as well as adherence to all specified inspection and maintenance intervals.

All other uses of the pressure gas wagon are improper.

2.2 Cleaning the pressure gas wagon

Cleaning inside the tank and the valves must only be undertaken by an authorised cleaning company.

2.3 Obligations according to RID

All of the safety obligations listed under point 1.4 of the "Regulations concerning the International Carriage of Dangerous Goods by Rail" (RID) must be adhered to by the parties concerned.

Information

The filler and unloader must ensure the proper functioning of the locks and the leaktightness of all locking facilities before and after filling and discharging.

2.4 Safety information

⚠WARNING

Risk of fire and explosion due to gases liquefied under pressure

Death or serious injuries may result from fire or explosion.

Gases liquefied under pressure present a significant hazard potential.

– Adhere to the operating safety regulations and instructions.
– Wear personal safety equipment. This includes helmet, safety shoes and safety gloves of the appropriate danger class.

⚠WARNING

Risk of fire and explosion due to static charging

Death or serious injuries may result from fire or explosion.

The tank may become electrostatically charged during filling, discharging and cleaning; this may trigger explosions or fires.

– During filling, discharging and cleaning, establish a highly conductive connection between one of the tank's earthing plates and the station (potential equalisation).

⚠WARNING

Risk of fire and explosion due to overfilling

Death or serious injuries may result from fire or explosion.

– When filling, adhere to the load limits and the specified filling capacity. The load limits and filling capacity may not be exceeded.

⚠WARNING

Risk of fatal injury from climbing onto the tank

Death or serious injuries may result from climbing onto the tank.

The atmosphere in the tank may be toxic or suffocating (for example, N_2 or other suffocating gases and atmospheres).

– Operators are prohibited from climbing onto the tank.
– Only authorised personnel may enter the tank. Bear the following in mind:
– Adhere to the operating safety regulations and instructions.
– Wear personal safety equipment corresponding to the product-specific safety regulations.
– Before entering: test the atmosphere in the tank.
– Only enter the tank if a second person remains in contact with you outside of the tank.
– In the event of respiratory problems, exit the tank as quickly as possible.

⚠WARNING

Risk of injury when filling or discharging pressurised tanks

Contact with a leaking pressurised product may cause serious injuries.

– Adhere to the operating safety regulations and instructions.
– Always connect the hose connections carefully.
– Secure the hose connections with the intended catches.
– Never release hose connections during filling or discharging.

⚠WARNING

Risk of injury due to product

Product can cause severe injuries on direct contact.

– Wear personal safety equipment.
– Observe the product-specific safety regulations.
– Adhere to the operating safety regulations and instructions.

⚠CAUTION

Risk of injury due to icing

Icing of the valves and pipes may cause cryogenic burns to the skin upon contact.

– Wear personal safety equipment.
– Observe the product-specific safety regulations.
– Adhere to the operating safety regulations and instructions.

NOTICE

Tank damage from overpressure

Overpressure may cause deformation of the tank.

– When filling, adhere to the load limits and the specified filling capacity. The load limits and filling capacity may not be exceeded.

2.5 What to do in an emergency

Preventive measures

– Comply with these operating instructions and adhere to the applicable safety information.
– Observe all applicable product-specific safety regulations.
– Comply with the operating safety regulations and instructions.
– Wear personal safety equipment corresponding to the product-specific safety regulations.
– Keep first aid equipment (first aid box, blankets, etc.) and fire extinguishers plus further necessary equipment as per the product-specific safety regulations ready to hand.
– Familiarise yourself with the location and use of safety, accident reporting, first aid and rescue equipment.

2.5.1 Measures in the event of personal injury

In an emergency

Comply with all applicable local emergency regulations. Immediately implement all necessary steps and first aid measures as per the applicable regulations and laws, especially:

1. Cease filling, discharging or cleaning.
2. Rescue persons from the danger zone.
3. Implement first aid measures.
4. Alarm a physician and the fire brigade.
5. Keep access routes free for emergency vehicles.
6. Inform the person responsible at the operating site.

First aid measures

– On contact with product: see product-specific safety regulations. Implement all suitable measures based on the applicable regulations.
– In the event of product release and fire: see product-specific safety regulations. Implement all suitable measures based on the applicable regulations.

2.5.2 Measures in the event of product overflow

If the product overflows during filling or discharging, comply with all local, applicable emergency regulations. Immediately implement all necessary steps and first aid measures as per the applicable regulations and laws, especially:

1. Cease filling or discharging.
2. Inform the person responsible at the operating site.
3. Discharge overfilled tanks to the permissible filling degree.

Irrespective of the measures described in Chapter 2.5, each operator bears full responsibility for his actions in each situation and for assessing the situation and implementing suitable measures as per the regulations and applicable laws. He is therefore responsible for damage arising from failure to comply with these measures, regulations and laws.

2.6 Safety devices

The pressure gas wagon may only be used with complete and operational safety devices.

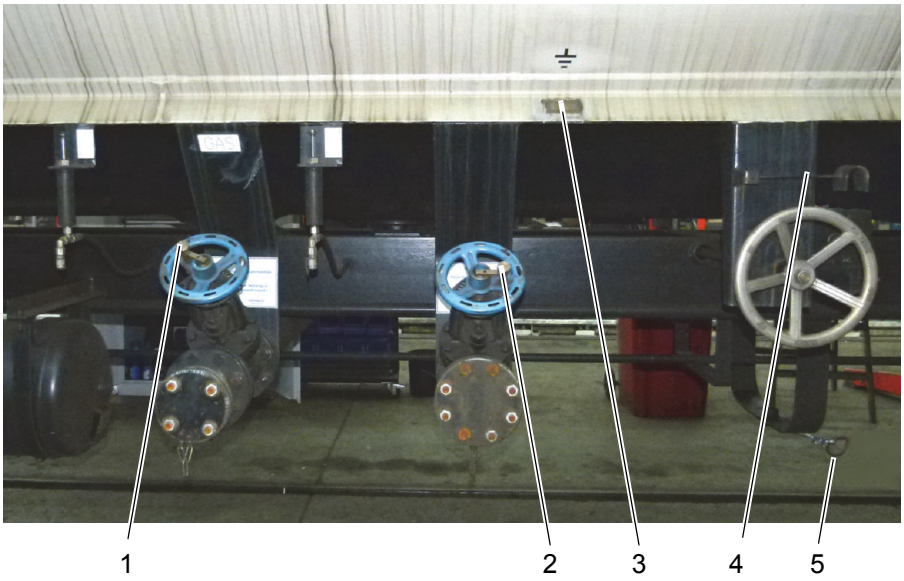

Figure 2.1:Safety devices on the filling and discharging facilities

Item	Safety device	Protective function
1	Hand wheel lock on the side valve of the gas phase The type of hand wheel lock depends on the valve type.	When the hand wheel lock is closed the hand wheel cannot be turned
2	Hand wheel lock on the side valve of the liquid phase The type of hand wheel lock depends on the valve type.	When the hand wheel lock is closed the hand wheel cannot be turned
3	Earthing plate	Earthing the tank prevents static charging during filling and discharging.
4	Locking the hand wheel on the hydraulic pump	When the locking device is closed, the hand wheel cannot be engaged. Activation of the hydraulic pump is not possible.
5	Slack rope with eye for hanging the rail hook	The hydraulic pump for opening the bottom valves can only be activated when the slack rope is tensioned. The bottom valves close automatically once the tension of the slack rope is loosened.

Figure 2.2:Crash buffer with indicator

Item	Safety device	Protective function
6	Crash buffer with indicator Depending on buffer design, the technical design may be a yellow triangle or a tensioning strap.	The indicator shows whether the crash buffer has been triggered. • The indicator is fully visible: The crash buffer is ready for use. • The indicator is not or only partially visible: The crash buffer has been triggered and must be replaced before operation.

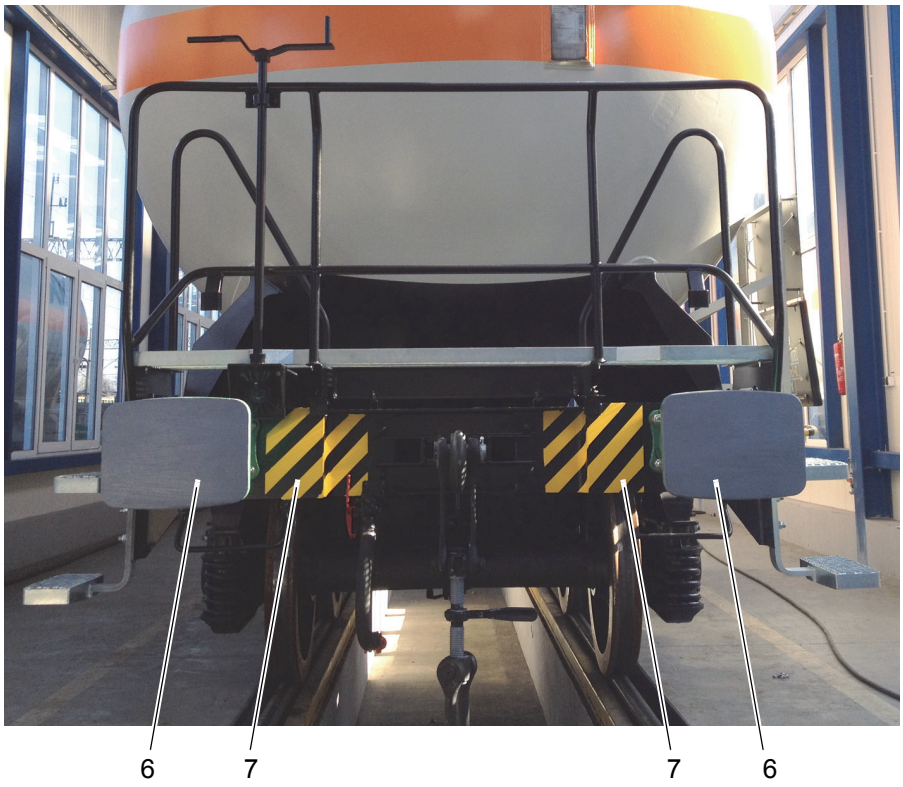

Figure 2.3:Labelling of the danger zone between the crash buffers

Item	Safety device	Protective function
7	Labelling of the danger zone between the crash buffers by black and yellow stripes	The safe area for the shunting person (Bern rectangle) may be limited if the crash buffers have been triggered. Only the area between the inside edges of the markings and the standard coupling is safe.

2.7 Warning and notice plates

2.7.1 Identification plate (tank plate)

The identification plate is located on the front side of the tank.

Data important for safely operating the pressure gas wagon are stamped on the identification plate.

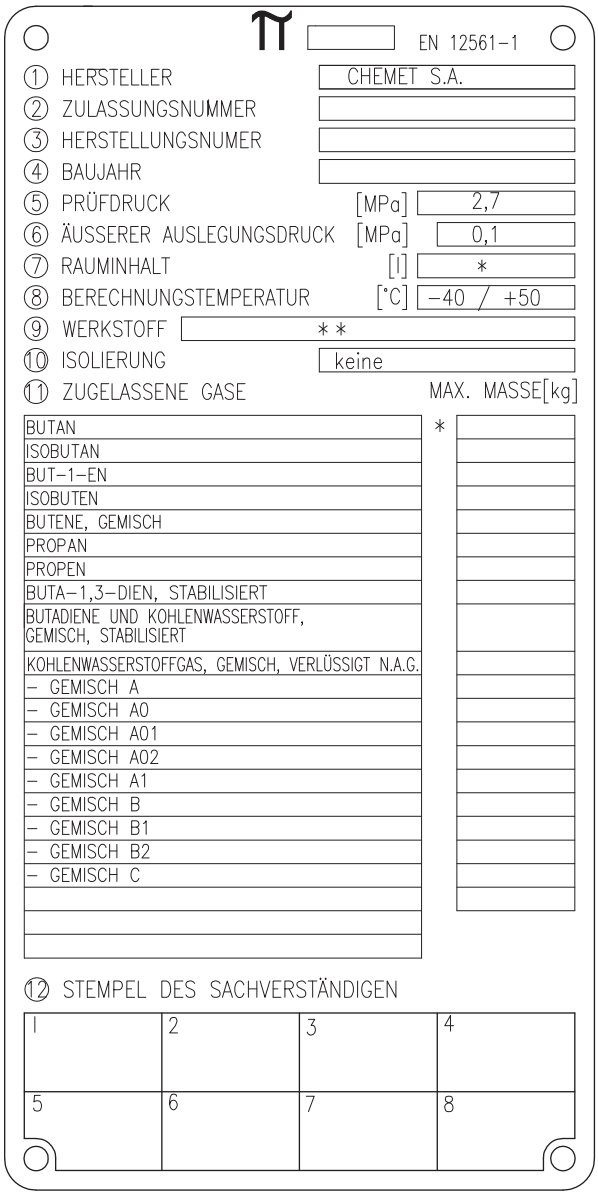

Figure 2.4:Identification plate on the tank of the pressure gas wagon

1	Tank manufacturer: Name or manufacturer's mark
2	Type approval number of the competent authority or an agency it has authorised. The last 4 digits following the "/" represent the code of the notified body
3	Production number, serial number of the tank
4	Year of construction
5	Test pressure [MPa]
6	External design pressure [MPa]
7	Capacity of the tank in litres [l]. The capacity of each chamber for multi-chamber tanks
8	Calculation temperature [°C]. This information is only required if the calculation temperature lies above +50 °C or below -20 °C.
9	Material of the shell, the floors according to EN, if present
10	Insulation Tanks for heat-insulated safety device: "thermally insulated" Tanks without insulation: "none"
11	Unabbreviated designation of the gases according to RID, for which the tank is approved, and the maximum permissible mass of filling in kg
12	Expert's stamp: • Fields 1 - 8 for stamps with test date (month, year)

2.7.2 Tank coding

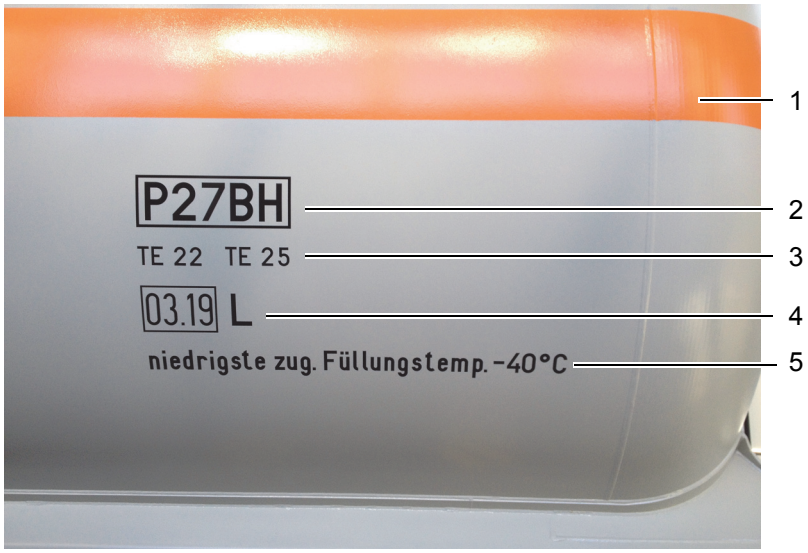

Figure 2.5:Labels: tank code, tank test for GATX type 7598/7599

1	A continuous orange stripe on the tank indicates a pressure gas wagon
2	Tank code
3	Special provisions according to RID
4	Next tank test and type of test
5	Lowest permissible filling temperature [°C]

The tank of the pressure gas wagon is identified with the following tank coding as per RID:

Tank code	Meaning
P	Tank type: Tank for liquefied or pressurised gases
27	Calculation pressure: Here for example 27 bar, different pressures possible
B	Openings: tank with floor opening with 3 closures for filling and discharging
H	Tank sealed airtight

2.7.3 Load table

Depending on the line category and speed, freight cars may only travel with a specific maximum load weight. The maximum load weight is entered in the internationally valid load table.

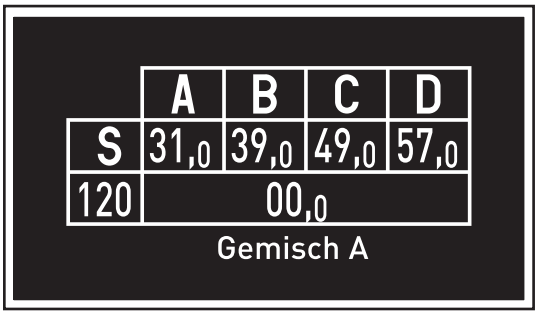

Figure 2.6:Example load table of a GATX pressure gas wagon

The number at the intersection of the line category (column) and speed (row) specifies the payload in tonnes. The speed is specified as a symbol or as a number in km/h. "S" stands for 100 km/h.

The product designation of the product being transported according to RID is located below the load table.

2.7.4 Labels and signs with operating notes

Operating note for the side valves

Figure 2.7:Label on the side valves

Actuate the side valves only by hand in order not to damage the bellows. The operation stroke is at DN 50 13 mm and at DN 80 20 mm.

The label is located behind the hand wheel on each of the side valves.

Operating note for the hydraulic pump

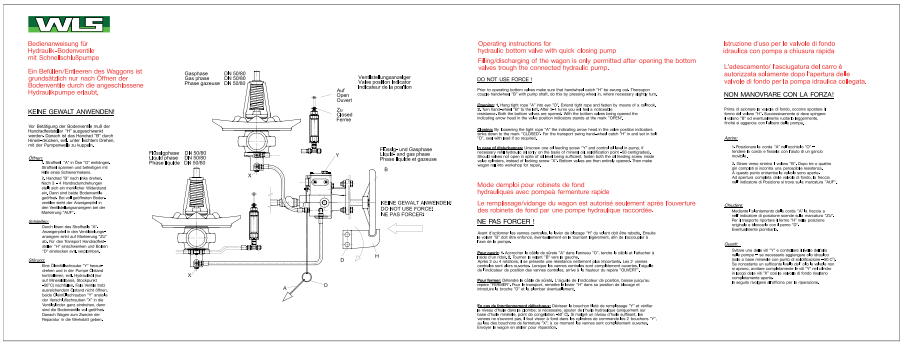

Figure 2.8:Operating note of the hydraulic pump manufacturer

The operating note for the hydraulic pump explains in German and possibly other languages how to open the bottom valves Also see Chapter 4.1 "Operation of the hydraulic pump for opening the bottom valves".

The label is located on the tank in the vicinity of the hydraulic pump hand wheel.

Labelling of the gas phase

Figure 2.9:Sign on the side valve of the gas phase

The "GAS" sign indicates the side valve of the gas phase. It is located above the side valve hand wheel.

Range of the valve position indicator

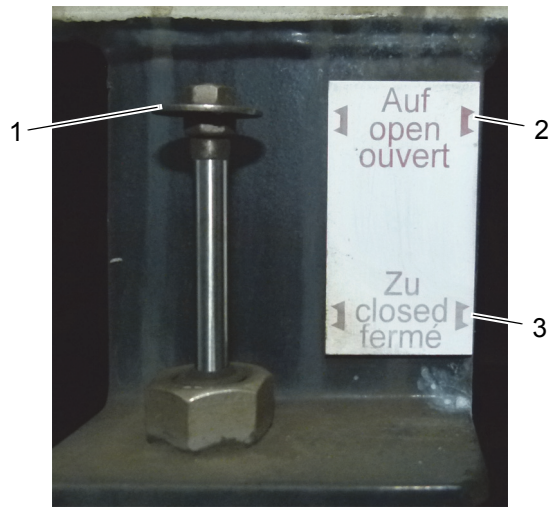

Figure 2.10:Open/close condition of the bottom valve

The valve position indicator (1) shows the open/close condition of the bottom valve.

- If it is in the area marked "open" (2), the bottom valve is completely open.
- If it is ion the area marked "closed" (3), the bottom valve is completely closed.

The sign is located next to the valve position indicator.

Labelling of the earthing plate

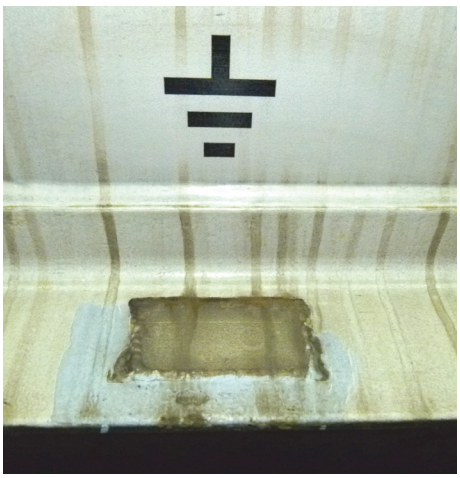

Figure 2.11:Label above the earthing plate

The label indicates the position of the earthing plates to which the potential equalisation is connected. There are two earthing plates on each side of the wagon.

3 Design and function

3.1 Design

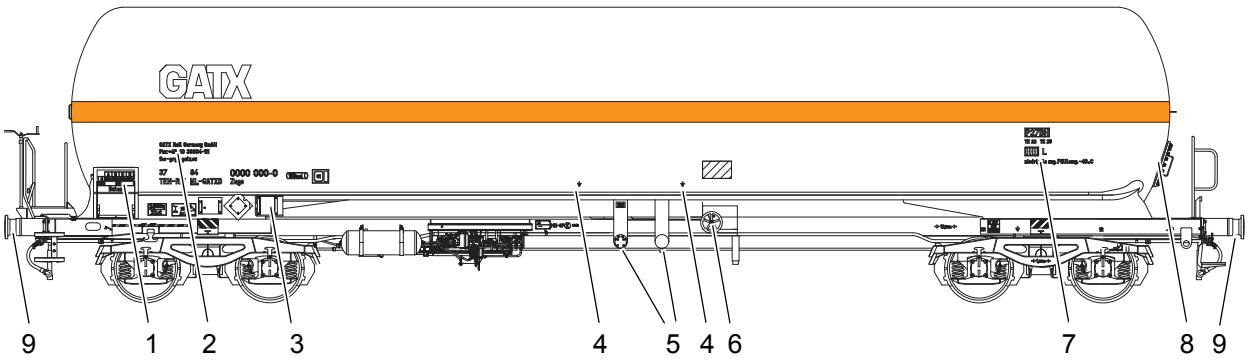

Figure 3.1:Pressure gas wagon, side view

1	Load table
2	Labels: • Owner • Handbrake parameters • Tank capacity as per RID • Clearance gauge, G1 for example • Optional: home station
3	Box for accompanying documents, mounting frame for UN number and danger label
4	Earthing plate
5	Filling and discharging facilities of the gas phase and liquid phase (observe labelling)
6	Hand wheel on the hydraulic pump
7	Labels: • Tank code • Tank test • Special provisions according to RID
8	Manhole (dome cover lid)
9	Crash buffer

3.2 Description of the modules

The following modules, connections and labels are identical on each side of the wagon:

- Gas phase side valve
- Liquid phase side valve
- Hand wheel for bottom valve operating device
- Valve position indicator for bottom valves
- Earthing plates
- Tank inscriptions
- Labels
- Load tables

3.2.1 Tank

The tank wagon's tank is filled and discharged from the bottom only.

The material of the tank is fine-grained steel. The precise type designation of the steel type is listed on the identification plate (tank plate).

3.2.2 Filling and discharge facilities

The filling and discharge facilities can be operated from both sides of the wagon.

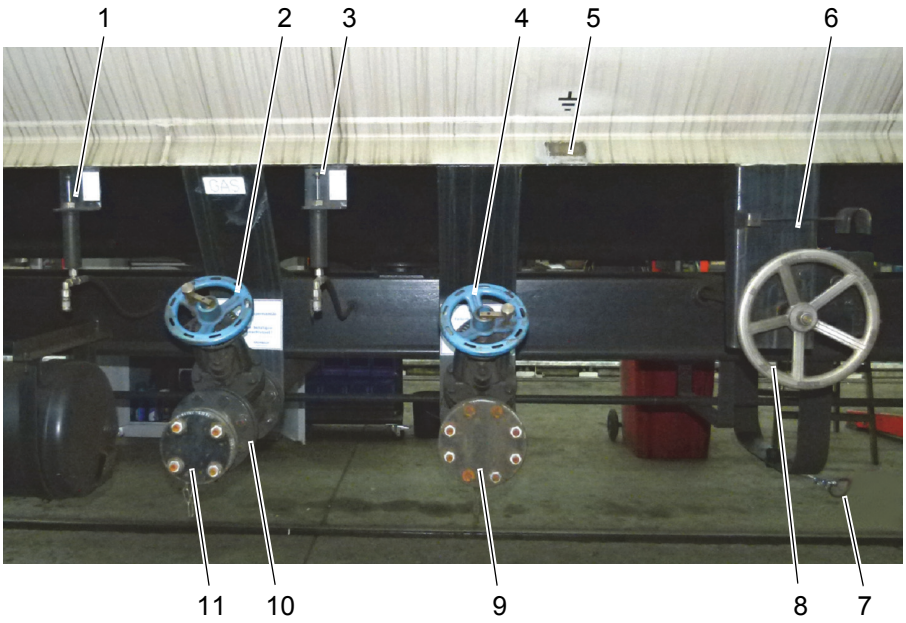

Figure 3.2:Filling and discharge facilities

1	Valve position indicator for the gas phase bottom valve
2	Hand wheel on the side valve of the gas phase
3	Valve position indicator for the liquid phase bottom valve
4	Hand wheel on the side valve of the liquid phase
5	Earthing plate
6	Locking the hand wheel on the hydraulic pump
7	Slack rope with eye for the rail hook
8	Hand wheel on the hydraulic pump
9	Blind flange DN 80 on the liquid phase side valve
10	Side valve outlet connection with reduction piece to DN 50
11	Blind flange DN 50 on the side valve of the gas phase

Information

The arrangement of the filling and discharging facilities is mirror inverted on the opposite side of the wagon.

– Observe labelling of the valves (gas phase, liquid phase).

Standard sizes of the connections:

Connections	Size, DN	Equipment
Side valve of the gas phase	(80) reduced to 50	Hand wheel Blind flange
Side valve of the liquid phase	80	Hand wheel Blind flange
Bottom valves	80	Hand wheel, hydraulic pump, valve position indicator, slack rope

Bottom valves

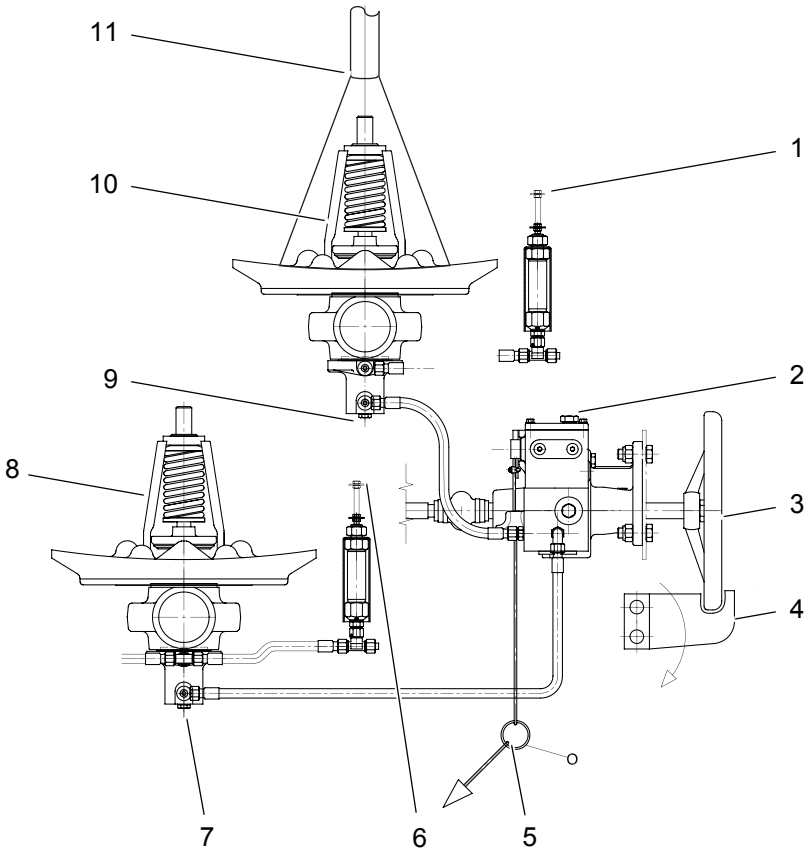

Figure 3.3:Bottom valves and hydraulic pump

1	Valve position indicator for the gas phase bottom valve
2	Hydraulic pump with oil filler screws/emergency actuation bolts
3	Hand wheel on the hydraulic pump
4	Hand wheel lock on the hydraulic pump different design possible
5	Slack rope with eye for the rail hook
6	Valve position indicator for the liquid phase bottom valve
7	Oil drain screw for hydraulic oil on liquid phase bottom valve
8	Bottom valve of the liquid phase
9	Oil drain screw for hydraulic oil on the gas phase bottom valve
10	Bottom valve of the gas phase
11	Gas pipe

Functional description

The filling and discharging of the tank is done via two bottom valves in the tank bottom.

The liquid phase of the gas liquefied under pressure flows via the bottom valve (8) into the tank. This can be done via gravity or pumps at the station.

Via the bottom valve (10), the gas phase in the tank is compensated with the gas phase in the tank of the station.

Both bottom valves are opened and closed hydraulically. The required hydraulic pressure for this is built up via a hydraulic pump (2). Also see Chapter 4.1 "Operation of the hydraulic pump for opening the bottom valves".

Side valves

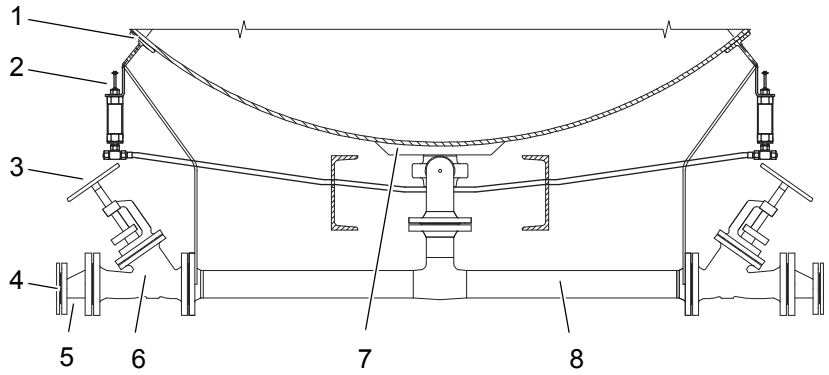

Figure 3.4:Side valves of the gas phase

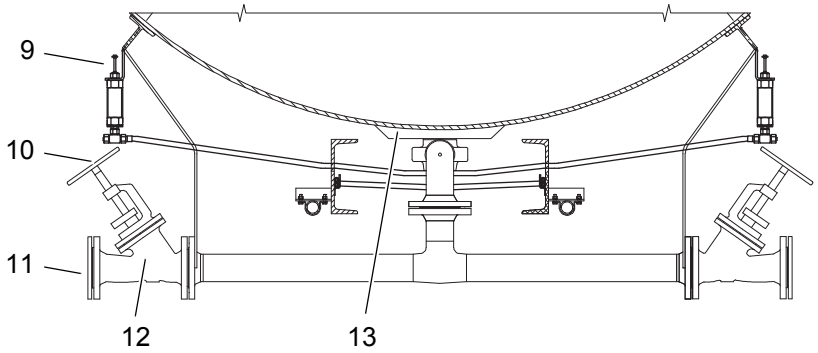

Figure 3.5:Side valves of the liquid phase

1	Tank shell
2	Valve position indicator of the bottom valve for the gas phase
3	Hand wheel on the side valve of the gas phase
4	Blind flange DN 50
5	Reduction piece DN 80 to DN 50
6	Side valve of the gas phase
7	Bottom valve of the gas phase

8	Product discharge pipe DN 80
9	Valve position indicator of the bottom valve for the liquid phase
10	Hand wheel on the side valve of the liquid phase
11	Blind flange DN 80
12	Side valve of the liquid phase
13	Bottom valve of the liquid phase

Functional description

The product discharge pipe below each bottom valve branches off via a t-pipe to both sides of the wagon and terminates with two side valves. This design is identical for the gas phase and liquid phase. The side valves are equipped with standardised flange connections for the connection to the station. To prevent confusion between the connections, the diameter of the side valve for the gas phase is set to DN 50 and for the liquid phase is set to DN 80

Each side valve is actuated using a hand wheel.

If in disuse, the side valves must be closed with a blind flange.

4 Controls

4.1 Operation of the hydraulic pump for opening the bottom valves

The hydraulic pump must be activated via the tensioned slack rope. To do so, a rail hook is hung in the eye of the slack rope and the slack rope tensioned.

Only when the hydraulic pump is activated can the hand wheel for opening the bottom valves be engaged in the hydraulic pump's gear box.

Turning the hand wheel builds up pressure in the hydraulic pump and the bottom valves open. The hand wheel can be turned in both directions to build up pressure. The valve position indicator shows the open/close condition of the bottom valves.

Once the slack rope is slackened both bottom valves close automatically (automatic function).

This automatic function is used to quickly close the bottom valves when the rail hook is released by hand.

Except when filling or discharging, the hydraulic pump's hand wheel must be secured with a hand wheel lock in disengaged state. The type of hand wheel lock depends on the valve type.

5 Filling the tank

Before filling, proper use of the tank as per Chapter 2.1 must be ensured.

5.1 Safety information

⚠WARNING

Risk of fire and explosion due to static charging

Death or serious injuries may result from fire or explosion.

The tank may become electrostatically charged during filling; this may trigger explosions or fires.

– During filling, establish a highly conductive connection between one of the tank's earthing plates and the station (potential equalisation).

⚠WARNING

Risk of fire and explosion due to overfilling

Death or serious injuries may result from fire or explosion.

– When filling, adhere to the load limits and the specified filling capacity. The load limits and filling capacity may not be exceeded.

⚠WARNING

Risk of injury when filling pressurised tanks

Contact with a leaking pressurised product may cause serious injuries.

– Always connect the hose connections carefully.
– Secure the hose connections with the intended catches.
– Never release hose connections during filling.

⚠WARNING

Risk of injury due to direct contact with the product

Product can cause severe injuries on direct contact.

– Wear personal safety equipment.

⚠WARNING

Risk of injury due to whipping hoses

Whipping hoses can cause severe injuries on contact.

– Only pressurise pressure hoses once both ends have been connected.

⚠CAUTION

Risk of injury due to icing

Icing of the valves and pipes may cause cryogenic burns to the skin upon contact.

– Wear personal safety equipment.

5.2 Filling the tank using the side valve and bottom valve

Prerequisites

- The tank and all valves are in technically flawless condition.
- The filling facility and the tank are conductively connected via the earthing plate (potential equalisation).
- All valves are closed.

Connecting and filling

1. Release the blind flange on the outlet connection of the gas phase side valve.
2. Connect the product hose flange to the side valve of the gas phase.
3. Release the blind flange on the outlet connection of the liquid phase side valve.
4. Connect the product hose flange to the liquid phase side valve.
5. Hang the rail hook into the eye of the slack rope and tension the rail hook.
6. Open the hand wheel lock on the hydraulic pump.
   Put the lever into parking position.
7. Engage the hand wheel in the gear box.
8. Open both bottom valves by turning the hand wheel.

   Read the opening angle of the bottom valves from the valve position indicator.

   The bottom valves are completely open when the valve position indicator is at "open".
9. Unlock the hand wheel lock on the gas phase side valve.
10. Perform pressure compensation. When doing so, open the gas phase side valve by carefully turning the hand wheel.

Pressure compensation is completed when no hissing sound can be heard or a connected gauge does not indicate overpressure.

11. Unlock the hand wheel lock on the liquid phase side valve.
12. Open the liquid phase side valve by turning the hand wheel.
13. Slowly fill the tank.

Disconnecting and locking

1. Release the rail hook from the slack rope.

   The bottom valves close automatically.

   The bottom valves are closed when the valve position indicator is at "closed".
2. Close the gas phase side valve by turning the hand wheel.
3. Close the liquid phase side valve by turning the hand wheel.
4. Release the product hose from the gas phase side valve.
5. Release the product hose from the liquid phase side valve.
6. Screw blind flanges onto the side valves.
7. Lock the hand wheel lock on the side valves.
8. Disengage and lock the hand wheel on the hydraulic pump.

5.3 Protective measures

5.3.1 Checking the condition of the wagon

Make sure all valves and locking facilities are leaktight. See RID, point 1.4.

5.3.2 Fitting a lead seal

Fit a lead seal on the filling and discharging facilities at the seal eyelets or seal holes if necessary.

5.3.3 Checking before operation

Before operation, especially check the following:

- Is the maximum permissible tank filling degree adhered to? See RID, point 1.4.
- Are the tank, the filling and discharge facilities, the underframe, the ladders or the platform externally damaged?
- Are the crash buffers undamaged?
- Are there defect notes from the railway company on the pressure gas wagon?
- Are all valves and locks correctly locked and secured?
- Are all attaching parts (hand wheels) present and secured?
- Are all shut-off devices leaktight?
- Are all accompanying documents complete and correctly attached to the tank?
- Are all signs and labels correctly attached to the tank and legible?

6 Discharging the tank

6.1 Safety information

⚠WARNING

Risk of fire and explosion due to static charging

Death or serious injuries may result from fire or explosion.

The tank may become electrostatically charged during discharging; this may trigger explosions or fires.

– During discharging, establish a highly conductive connection between one of the tank's earthing plates and the station (potential equalisation).

⚠WARNING

Risk of injury when filling pressurised tanks

Contact with a leaking pressurised product may cause serious injuries.

– Always connect the hose connections carefully.
– Secure the hose connections with the catches provided.
– Never release hose connections during filling.

⚠WARNING

Risk of injury due to direct contact with the product

Product can cause severe injuries on direct contact.

– Wear personal safety equipment.

⚠WARNING

Risk of injury due to whipping hoses

Whipping hoses can cause severe injuries on contact.

– Only pressurise pressure hoses once both ends have been connected.

⚠WARNING

Risk of injury due to icing

Icing of the valves and pipes may cause cryogenic burns to the skin upon contact.

– Wear personal safety equipment.

6.2 Discharging the tank using the side valve and bottom valve

Prerequisites

- The tank and all valves are in technically flawless condition.
- The filling facility and the tank are conductively connected via the earthing plate (potential equalisation).
- All valves are closed.

Connecting and discharging

1. Release the blind flange on the outlet connection of the gas phase side valve.
2. Connect the product hose flange to the side valve of the gas phase.
3. Release the blind flange on the outlet connection of the liquid phase side valve.
4. Connect the product hose flange to the liquid phase side valve.
5. Hang the rail hook into the eye of the slack rope and tension the rail hook.
6. Open the hand wheel lock on the hydraulic pump.
   Put the lever into parking position.
7. Engage the hand wheel in the gear box.
8. Open both bottom valves by turning the hand wheel.

   Read the opening angle of the bottom valves from the valve position indicator.

   The bottom valves are completely open when the valve position indicator is at "open".
9. Unlock the hand wheel lock on the gas phase side valve.
10. Perform pressure compensation. When doing so, open the side valve by carefully turning the hand wheel.

    Pressure compensation is completed when no hissing sound can be heard or a connected gauge does not indicate overpressure.
11. Unlock the hand wheel lock on the liquid phase side valve.
12. Open the liquid phase side valve by turning the hand wheel.
13. Discharge the tank.

Disconnecting and locking

1. Release the rail hook from the slack rope.

   The bottom valves close automatically.

   The bottom valves are closed when the valve position indicator is at "closed".
2. Close the gas phase side valve by turning the hand wheel.
3. Close the liquid phase side valve by turning the hand wheel.
4. Release the product hose from the gas phase side valve.
5. Release the product hose from the liquid phase side valve.
6. Screw blind flanges onto the side valves.
7. Lock the hand wheel lock on the side valves.
8. Disengage and lock the hand wheel on the hydraulic pump.

6.3 Discharging the tank using the emergency actuation bolts

If the bottom valves cannot be opened hydraulically, each can be forcibly opened mechanically using an emergency actuation bolt.

The two emergency actuation bolts (1) are located in the lid of the hydraulic pump (2) and close the oil filler necks. They have the following dimensions: G 3/4", length 80 mm.

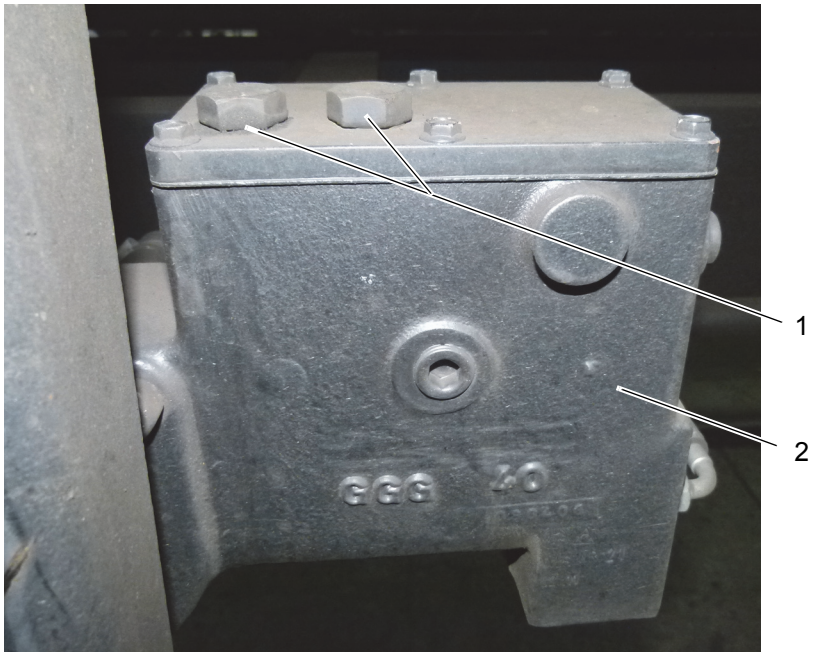

Figure 6.1:Emergency actuation bolts on the hydraulic pump

To open a bottom valve, screw in the emergency actuation bolt into the opening of the oil drain screw (3) underneath the bottom valve. The bottom valve is completely open when the emergency actuation bolt is screwed in all the way.

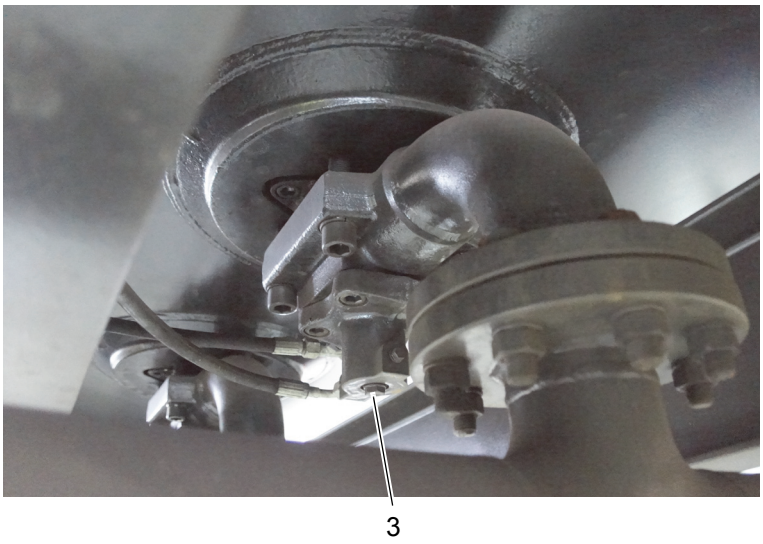

Figure 6.2:Oil drain screw beneath the bottom valve

NOTICE

Material damage due to incorrect actuation

The emergency actuation bolts may only be used to discharge the tank. Opening the bottom valves for filling in this manner is not permissible.

– After forcibly opening the bottom valves, immediately transfer the tank wagon to a specialist workshop.

Connecting and discharging using emergency actuation bolts

1. Unscrew the emergency actuation bolts from the oil filler necks on the hydraulic pump.
2. Release the blind flange on the outlet connection of the gas phase side valve.
3. Connect the product hose flange to the side valve of the gas phase.
4. Release the blind flange on the outlet connection of the liquid phase side valve.
5. Connect the product hose flange to the liquid phase side valve.
6. Place the collection container for hydraulic oil below the bottom valve.
7. Unscrew the oil drain screw of both bottom valves.

   The hydraulic oil flows out.
8. Screw the emergency actuation bolt all the way into the threaded opening of the oil drain screw on both bottom valves.

   The bottom valves are opened.
9. Unlock the hand wheel lock on the gas phase side valve.

10. Perform pressure compensation. When doing so, open the side valve by carefully turning the hand wheel.

    Pressure compensation is completed when no hissing sound can be heard or a connected gauge does not indicate overpressure.

11. Unlock the hand wheel lock on the liquid phase side valve.
12. Open the liquid phase side valve by turning the hand wheel.
13. Discharge the tank.

Information

The valve position indicator only moves if the hydraulic oil circuit is intact. Correct indication is not possible if there is no hydraulic oil.

Disconnecting and locking

1. To close the bottom valves, unscrew the emergency actuation bolts.
2. Screw the oil drain screws back into the openings.
3. Close the gas phase side valve by turning the hand wheel.
4. Close the liquid phase side valve by turning the hand wheel.
5. Release the product hose from the gas phase side valve.
6. Release the product hose from the liquid phase side valve.
7. Screw blind flanges onto the side valves.
8. Lock the hand wheel lock on the side valves.
9. Screw the emergency actuation bolts back into the oil filler necks on the hydraulic pump.
10. Transfer the wagon to a specialist workshop.

6.4 Protective measures

6.4.1 Checking the condition of the wagon

Make sure all valves and locking facilities are leaktight. See RID, point 1.4.

6.4.2 Checking before operation

Before operation, especially check the following:

- Is the maximum permissible tank filling degree adhered to? See RID, point 1.4.
- Are the tank, the filling and discharge facilities, the underframe, the ladders or the platform externally damaged?
- Are the crash buffers undamaged?
- Are there defect notes from the railway company on the pressure gas wagon?
- Are all valves and locks properly locked and secured?
- Are all attaching parts (hand wheels) present and secured?
- Are all shut-off devices leaktight?
- Are all accompanying documents complete and correctly attached to the tank?
- Are all signs and labels correctly attached to the tank and legible?

7 Cleaning

Cleaning inside the tank and the valves may only be performed by an authorised cleaning company.

7.1 Safety information

⚠WARNING

Risk of fire and explosion due to static charging

Death or serious injuries may result from fire or explosion.

The tank may become electrostatically charged during filling; this may trigger explosions or fires.

– During filling, establish a highly conductive connection between one of the tank's earthing plates and the station (potential equalisation).

⚠WARNING

Danger of fatality on climbing onto the tank

Death or serious injuries may result from climbing onto the tank.

The atmosphere in the tank may be toxic or suffocating (for example, N_2 or other suffocating gases and atmospheres).

– Operators are prohibited from climbing onto the tank.
– Only authorised personnel may enter the tank. Bear the following in mind:
– Wear personal safety equipment corresponding to the product-specific safety regulations.
– Before entering: test the atmosphere in the tank.
– Only enter the tank if a second person remains in contact with you outside of the tank.
– In the event of respiratory problems, exit the tank as quickly as possible.

NOTICE

Damage due to ingressing water

– If external cleaning is necessary, water ingress into the insulation must be avoided.
– Do not use a high-pressure cleaning system in the vicinity of the insulation cladding's welding seam area.

NOTICE

Material damage

Incompatible cleaning agents can attack and destroy the tank, cover plate and seals.

– Use only cleaning agents that are compatible with the tank and sealing materials.
– Contact GATX Rail Europe directly in the event of questions.

NOTICE

Corrosion damage due to water

Contact corrosion on valves due to trapped moisture.

– All valves must be free of cleaning agents.
– Only close cleaned valves once they are completely dry.

7.2 Transferring the pressure gas wagon to an authorised cleaning company

Prerequisite

- The tank has been completely discharged.

7.3 Protective measures

After cleaning, check the condition of the gas pressure wagon, especially:

- Have all cleaning agent residues been removed?
- Have all previously removed parts been completely and correctly installed again?
- Are all seals undamaged?
- Are all seals seated correctly?
- Have all released threaded connections been tightened correctly?
- Are the crash buffers undamaged?

8 Disuse for an extended period

8.1 Safety measures when in disuse for an extended period

If the pressure gas wagon is not used for an extended period of time, GATX recommend the following safety measures to avoid material damage:

- If necessary, have the the tank, connections and lines cleaned and dried by an authorised cleaning company.
- Supply nitrogen (N_2) to the tank to avoid corrosion.
- Clean the wagon from the outside.
- Lock the dome cover lid and fit a lead seal if necessary.

8.2 Measures prior to re-commissioning

Before re-commissioning, check the following components are in technically flawless condition, specifically:

- The leaktightness and function of all locking facilities
- The integrity of the crash buffer.
- The tank, fittings and underframe for corrosion damage.
- The completeness and function of the equipment.

Also check:

- Adherence to statutory inspection intervals.
- Adherence to the general commercial terms.

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